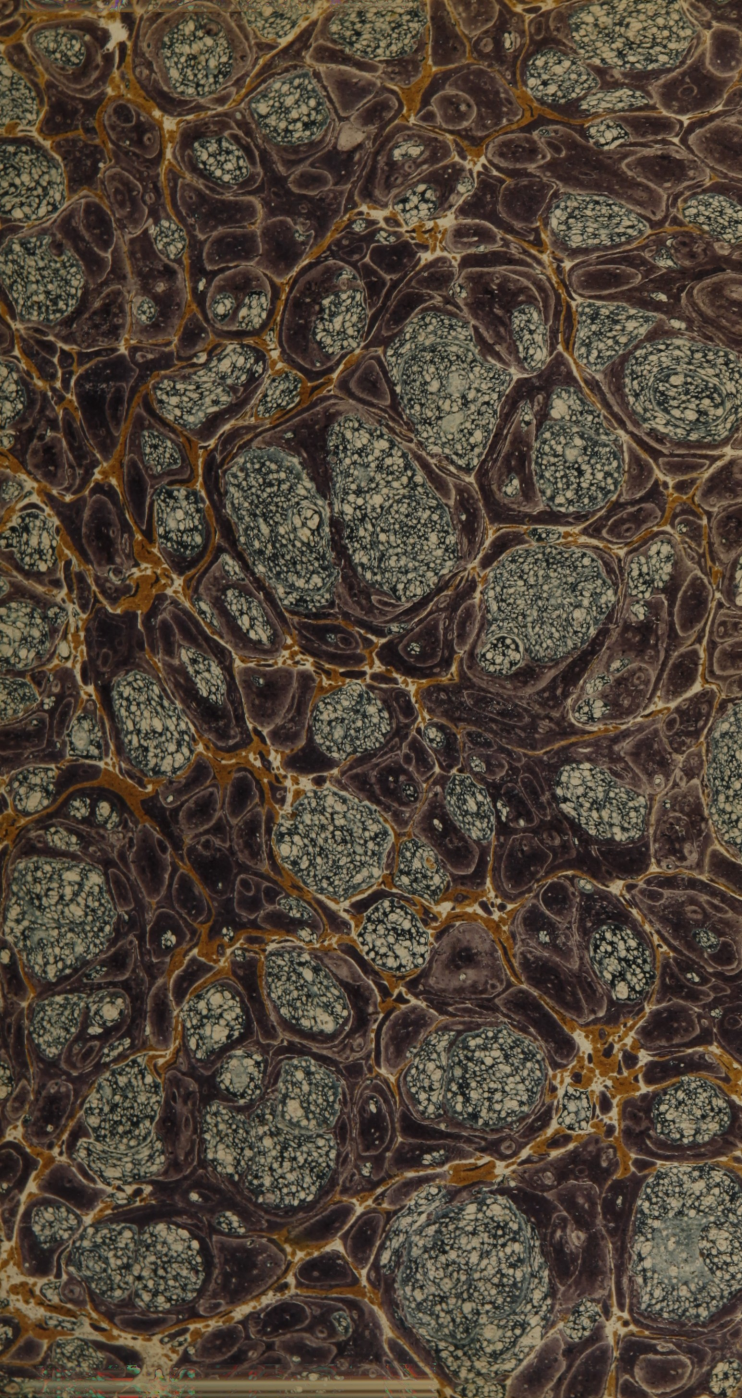


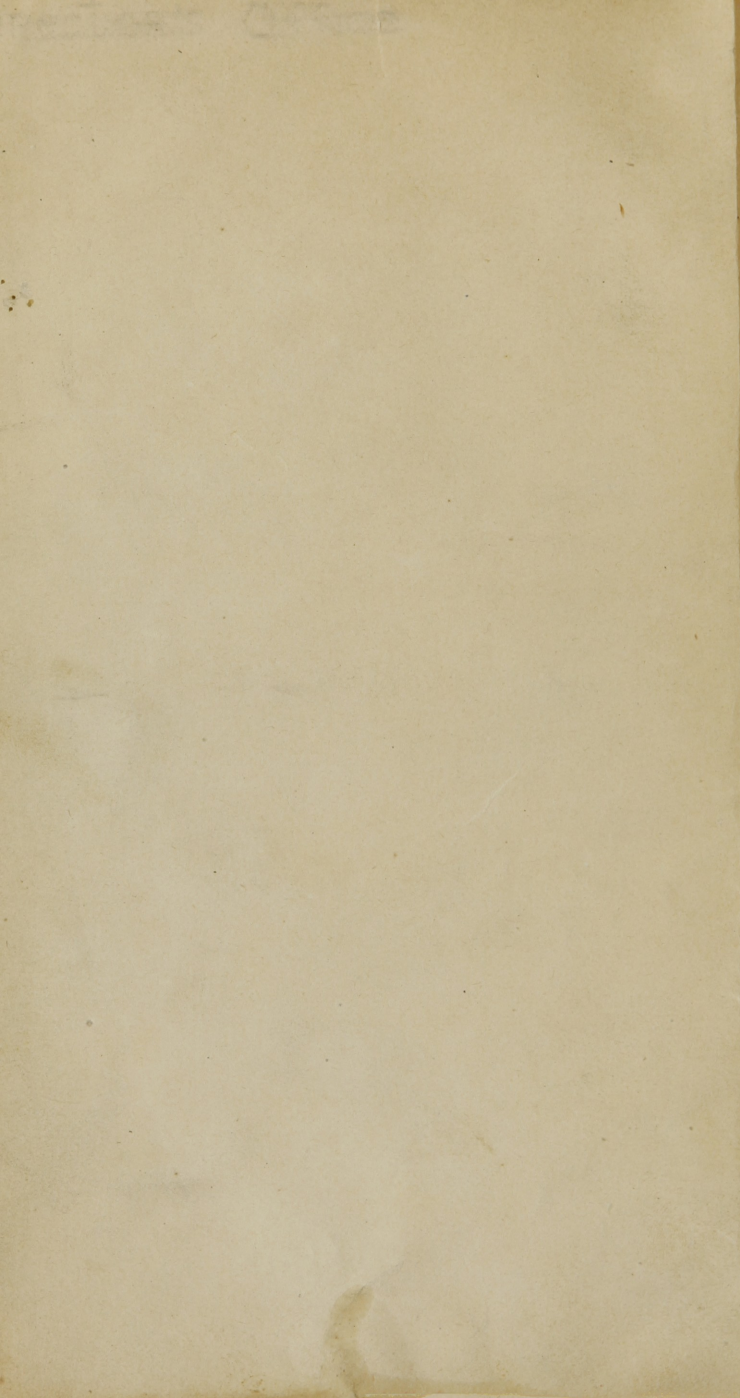
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ECONOMICAL OBSERVATIONS

ON

MILITARY HOSPITALS;

AND

THE PREVENTION AND CURE OF DISEASES

INCIDENT TO AN ARMY,

IN THREE PARTS:

ADDRESSED

I. TO MINISTERS OF STATE AND LEGISLATURES.

II. TO COMMANDING OFFICERS,

III. TO THE MEDICAL STAFF.

By JAMES TILTON, M. D.

PHYSICIAN AND SURGEON IN THE REVOLUTIONARY ARMY

OF THE UNITED STATES.

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On mules and dogs the infection first began,
And last the baneful arrows fixed in man.

ILIAD, BOOK I.

WILMINGTON, (DEL.) PRINTED BY J. WILSON.

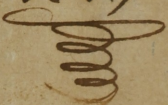
1815.

P. Macaulay
from his
friend

D. J. Tilton

Philada Aug 1st

1814



District of Delaware, ss.

BE it remembered that on the twenty first day of February, A. D. 1813, in the thirty-seventh year of the Independence of the United States of America, JAMES TILTON, M. D. of the said district hath deposited in this office the title of a book the right whereof he claims as proprietor, in the words following, to wit: "CEconomical observations on Military Hospitals and the prevention and cure of diseases incident to an army. In three parts. Addressed 1st to Ministers of State and Legislatures. 2d To commanding officers. 3d To the Medical staff. By James Tilton, M. D. Physician and Surgeon in the Revolutionary Army of the United States." In conformity to the act of Congress of the United States, entitled "An act for the encouragement of learning, by securing the copies of Maps, Charts and Books to the authors and proprietors of such copies during the times therein mentioned," and also to the act entitled "An act supplementary to an act entitled an act for the encouragement of learning by securing the copies of Maps, Charts and Books to the authors and proprietors of such copies during the times therein mentioned and extending the benefits thereof to the arts of designing, engraving and etching historical and other prints."

A. JOHNS, C. D. C. D. D.

TO
GENERAL JOHN ARMSTRONG,

SECRETARY OF WAR:

SIR,

Although I have not the honor of a personal acquaintance with you, I am sufficiently acquainted with your character to know that you are a competent judge of the following essay; and that your official station puts it very much in your power to extend its usefulness, according to its merits. Permit me, therefore, to recommend it to your patronage so far as you may deem it of public utility.

And be assured that I am, with great respect for your talents as a man and your virtues as a citizen,

Sir,

Your most obedient servant,

J. Tilton

Belleune (near Wilmington Del.)
24 Feb 1816.

PREFACE.

EXPERIENCE is said to be the best of teachers; and our own is better than that of other people. I have, therefore thought it matter of serious regret, that no one has hitherto publicly communicated his remarks upon the conduct and success of the military hospitals of our revolutionary army. Having long waited in fruitless expectation, from abler hands, I have resolved at least to introduce the subject. As another war has commenced, the public in general, as well as the army in particular, must be deeply interested, in a recollection of what has passed. My feeble essay may serve at least as an example and stimulus to those better qualified for the task.

The first part of this work, or that addressed to ministers of state and legislatures, was written A. D. 1781, at a time of general reform in the army. It was laid before the medical committee of Congress, of which Gouverneur Morris was chairman, and likewise presented to the financier, Robert Morris, Esq; who was called upon, by Congress, to report upon the medical, in common with other departments of the army. Both the chairman of the medical committee and the financier expressed an entire approbation of my observations. Nevertheless, the financier, before he would act upon them, in his report, thought it adviseable to have them impugned by three respectable physicians of Philadelphia, viz. Doctors Jones, Hutchinson and Clarkson. These gentlemen, by their report, sanctioned the whole of my theory; and only advised some trivial alteration, in the plan of arrangement, as to the mode of appointing stewards, and in recommending eight hospital surgeons only, instead of thirteen, which I had proposed. I have conformed, in this publication, to their modes of appointing stewards; but am still of opinion, that one hospital surgeon, to every major general's command, is a good proportion: more especially when it is taken into consideration, that in all wars, the whole force of the United States, must be divided into several armies, stationed at different points, for the defence and protection of a widely extended continent.

I have every reason to think the medical committee and financier employed their joint influence to have

the principles and plan I had suggested, adopted by Congress. Great reforms were made, and the number of prescribing surgeons were reduced to thirteen. But it was impossible to overcome entirely the influence of interested individuals. The medical board, intended as the base of the whole system, was never instituted; more than one physician general was retained; and the flying hospital remained a kind of separate department, to the end of the war. Nevertheless, the success of the hospitals was much improved; there was more responsibility, and the prescribing surgeons had reason to expect all the credit of their successful endeavors.

I have therefore reason to be well satisfied with this first part. It was written after five years service, and in the midst of official duties, observations and enquiries, that gave me a full comprehension of the subject. It has also been scanned and approved by those best qualified to judge of its merits. And I may reasonably expect, it will now meet with a favorable reception from the public.

But the two last parts, or those addressed to commanding officers and the medical staff, may require apology. They were hastily written, in the course of a few leisure evenings, this winter, 1813, thirty years after my derangement from the service, and with very few documents to assist me, excepting such as relate merely to time and place. However imperfect, I hope they will be considered as well intended. My medical brethren particularly will have it in their power to supply all defects, by farther observations.

My observations were made in the middle department with the main army, under the immediate command of the commander in chief. I have had no means of comparing them with what passed in the northern or eastern department of our army. But my friend, doct. George Monro, who was kind enough to revise these sheets before they went to press, assures me, that my remarks correspond correctly with what happened in the southern department, where he served several years. He alledges, however, that they made less use of general hospitals than we did, that their medical system was less complex and proportionably more successful. This may have been very much owing to their army being smaller, and the period of service at a time when the

troops were veteran and reduced to better discipline than when we commenced the war.

It may be observed that I have studied brevity throughout the whole performance; that instead of giving my readers the trouble of picking a good idea now and then out of a pile of verbage, my object has been to condense important topics within the smallest compass possible; and that the whole is intended merely as a manuel, vademecum or text book, which every man of laudable ambition, who wishes to enquire into the subjects treated of, may carry in his pocket.

ECONOMICAL OBSERVATIONS

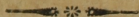
ON

MILITARY HOSPITALS, &c.

PART I.

ADDRESSED

TO MINISTERS OF STATE AND LEGISLATURES.



It is remarkable, that none of the military writers have paid much attention to the regulation of military hospitals; and while every other branch of army arrangements is digested into method and system, yet this is still unsettled, different in almost every service, changeable and to be learned at the commencement of every war. Sir John Pringle and Donald Monro seem to be the first writers who have attempted any thing of essential use even to the medical gentlemen of an army; and Dr. Brocklesby is the only author, that I have met with, who has written on the subject of military hospitals, with a special regard to *statesmen* and commanding officers. This learned and candid physician was the immediate successor of Sir John Pringle, as principal and head of the medical department, in the British army. He wrote from practical observation, and has given us some general hints that do him great honor. But the good doctor lived under a monarchical government, where it was dangerous to give the least offence to favorites; and frankly confesses he was long retarded in his intention of writing, for fear of altercation in the medical department; and

seems at last to be stinted in his design, rather than risk his own ease and conveniency.

I rejoice in the advantage I have over Brocklesby, *in time and place*. I write under a republican government, where the first principle of my education, the love of my country, teaches me to banish every fear, as well as every selfish consideration, that can come in competition with the public good ; and at a time of general reform of the army, when I am led to believe, that every honest endeavor will be acceptable to virtuous rulers, and the simple garb of truth will render my style most agreeable.

Zeal alone, however, will not render me of sufficient authority. But, if a diligent application to all the duties of a prescribing surgeon, for five years, and having served in a regiment as well as the hospital, so to become acquainted with the duties of every station, can, in anywise compensate for moderate abilities and give some weight to my observations, I hope to establish them, by the concurrent remarks of the best authorities : and it will make me extremely happy to succeed so far in my design, as to render it acceptable to Congress and through them advantageous to the army.

It is now an established maxim, that the direction of the practice and the purveyorship of the hospitals should be entirely distinct and separate, in different hands, so as to be a check upon each other. We need not have paid so dear for our instruction upon this head, had the least attention been given to the salutary advice of Dr. Monro, who expressly says, “ the *directing* and *purveying* branches ought never to be entrusted to the same person, as the temptation of

accumulating wealth, has, at all times, and in all services, given rise to the grossest abuses, which have been of great detriment to the service, and has occasioned the loss of many lives. And therefore neither the physician general, nor any of the physicians or surgeons of the army, or any other person concerned in the direction of military hospitals, ought ever to act as purveyor or commissary; nor ought they ever to have any thing to do with the accounts, contracts or any other money affairs relating to the hospital; and if ever they be found to intermeddle in these affairs, *they ought to be immediately dismissed the service.* The purveying or commissariate branch ought to be entirely distinct from the physical. The purveyors or commissaries ought punctually to obey whatever orders they receive from the physicians and surgeons, to provide every thing for the hospitals; and their accounts ought to be controled by such persons as the government may think proper.”*

It might seem to be unnecessary to make so long a quotation, in support of a point settled so long ago as the beginning of the campaign of 1778. But am I not warranted from hence, to suggest to Congress what Xenophon ranks among the virtues of Cyrus; that previous to the war, he selected the ablest and most disinterested physicians to preconcert proper plans for the management of the sick; and after they had performed their task, dismissed them with suitable rewards? And may I not, consistent with perfect decency and respect, compare the conduct of this wise prince, with the practice of modern

times, when a director general alone (or with the advice of a few interested persons) is called upon to form a plan for conducting the hospitals, which he himself is to execute; in the formation of which, he may be directed entirely from the most salutary methods of curing the sick; to plans of gain, big with all the fatal consequences mentioned by Dr. Monro? I mention it not with a design to reflect on any man, that in the fatal year 1777, when the director general had the entire direction of practice in our hospitals, as well as the whole disposal of the stores, he was interested in the increase of sickness, and the consequent increase of expence, so far at least, as he would be profited by a greater quantity of money passing through his hands. Even at that time he might have done the best he could, though Congress did not chuse to trust him any longer with the same inordinate powers; and, I trust, will never again lay any man under the same temptations.

But the sole use I wish to make of this observation is, to remind Congress, that notwithstanding the evident impropriety of loading any one man with powers so multiplied and dangerous in their tendency, yet it was found to be very difficult to arrest any part of them from the director; and even when Congress had ordained the direction of practice and purveyorship to be separated, such was the influence of interested men, that the utmost efforts of the prescriptive line have never been able to carry it into execution, in the full and complete manner intended. And hence I would wish to awaken Congress to further care in establishing this

leading principle, and especially to excite their attention to several other great out-lines, of no less consequence in the economy of military hospitals, of which I shall proceed to take notice.

Having no written instruction as to the proportion of sick or subjects proper for the general hospital, it is of great importance to attend carefully to such observations relative to this matter, as we are able to collect. The scale of the hospitals seems to be different in different services. The French make greater hospital provision than the English, and the English than the Germans; yet the French lose more men of camp diseases than the English, and the English than the Germans; and I may add, the Americans have out-done all their predecessors in the pomp and extravagance of their hospital arrangements, and have surpassed all other nations, in the destruction and havoc thereby committed on their fellow citizens.

It would be shocking to humanity to relate the history of our general hospital, in the years 1777 and 1778, when it swallowed up at least one half of our army, owing to a fatal tendency in the system to throw all the sick of the army into the general hospital; whence crowds, infection and consequent mortality too affecting to mention. I doubt not but humanity at first dictated the ample provision made for the sick in general hospitals; but we should learn, from experience, to contract our plan into greater simplicity; and to make it the *interest*, as well as the duty of all concerned in curing the sick, to send as few as possible to the general hospital.

If it should be alledged, that for two cam-

paigns past, our hospitals have had better success ; I answer, that since the battle of Monmouth, our army has not been so much harrassed by hard duty, as before ; and that the troops being veteran, with better discipline and a variety of other circumstances contributing to good health, the whole sick of the army was not sufficient to crowd the hospitals ; and had a proper proportion only of those been attended in hospitals, it would not only have contributed to a still more successful treatment of the sick ; but it would have abated very much of that *extravagance*, which has ever been a reproach to the department.

That no argument may be wanting to shew the propriety of lessening the proportion of sick in the hospitals, and increasing the scale of regimental practice, in our army, I am happy to have it in my power to adduce two of the first authorities in Europe, in point as to this matter.

Sir John Pringle expects his readers to be surprised, that he should rank the hospitals intended for *health* and *preservation*, among the chief causes of *sickness* and *death* in an army. He describes a melancholy scene of infection, whose pestilential influence nothing could suppress, until, by general orders, the hospitals at Bruges and Ghent were broke up, and the sick distributed, in small parcels, under the care of the regimental surgeons. The doctor candidly acknowledges, this was done from the sole motive of frugality ; but that it had the more happy effect of preventing any farther infection.*

It is notorious that Frederick, king of Prus-

* Vid. observations, chap. 3 & 4.

sia made very little use of general hospitals. Wounds and chronic diseases were the only cases he suffered to be carried any distance from camp. All acute diseases of his army were treated by the regimental surgeons, or in what he called his field hospitals. And I am told from good authority,* that it was customary, in the late German war, for the hospital staff of the British army, almost wholly to retire, to England, during the winter.

It would appear from what has been said, that the humane and benevolent design of large and extensive hospital accommodations must necessarily be defeated in the execution; that profusion and extravagance serve only to precipitate destruction and ruin, and that economy and frugality are necessary to the success of our hospitals. Paradoxical as this may seem to some, it is not the less true. The observation before cited from Sir John Pringle, is pointedly to this purpose. And I appeal to all the experienced officers of our army, if more men have not been lost by death and otherwise wasted, at general hospitals, than by all other contingencies that have hitherto affected the army, not excepting the weapons of the enemy. Is it not, then, high time to contract our plan, more conformable to the Prussian practice before cited?

I hope, from these considerations, whenever Congress shall revise the medical department, they will free it from that complexity which has hitherto contributed very much to crowd the hospitals; and abolishing all separate depar-

* Dr. William Brown, one of the physicians general of our army.

ments and every distinction between general and flying hospitals, will arrange the officers of the hospital into one corps, connected with the army, and capable of a uniformity of conduct, in all the armies the government may have occasion to employ. The flying hospital being only useful when the army is in the field, should be a temporary institution. In every service, except the American, it is considered as a branch of the general hospital, under the same common head and managed by the same set of officers, so as to maintain a reciprocal and common interest. It is very different in our army, where a chief physician and all subordinate arrangements constitute a flying hospital of permanent institution and consequently a great extravagance ; and creating a distinction of interest between the flying and general hospitals, might in worse hands than at present, be attended with dangerous consequences : for the former may at pleasure and without restraint send all their sick to the latter, and crowd them, regardless of consequences.

To give the regimental practice weight and efficacy, an honorable appointment and good pay are especially necessary to the surgeons ; and if certain perquisites were to be connected with the practice, such as the service will admit of, a two fold benefit to the army would flow from it. Every surgeon would be prompted from motives of interest, not only to attend such patients as offered ; but also to excel in skill and success, as the means of obtaining more. Dr. Brocklesby, who lays great stress on the medical character, says, the surgeon should be considered as the fourth character in a regiment,

or next in consequence to the field officers; and to give him that weight and influence necessary to extensive usefulness, he recommends the utmost care in the manner of appointment. The method he most approves is, by a board of physicians or surgeons of the army, (who are certainly the best judges) and observes that very mischievous consequences ensued to the British army, when that salutary method, by some neglect, fell through, and the appointments were made *by the surgeon general only*.

But surgeons of ability, such as are able to pass the scrutiny of a board, cannot be retained in the service, without a valuable consideration, Brocklesby, after proposing that the surgency should be increased in value, by the manner of sale and otherwise, concludes with this observation. "Such a competency as 250*l.* per annum, in time of peace, would be an inducement, to divest themselves of ambition and to quit the further bustle of a busy world, for the means of a genteel employment, in those paths, into which, from their first out-setting in life, they had early entered."* In the British service, every officer employs what surgeon he pleases and pays for his services. There are also various perquisites to the regimental surgeons, from the private men, which I am not perfectly acquainted with. I will not undertake to say, what perquisites our army can afford to the surgeon. Perhaps that had best be left to such a board as follows.

Agreeably to the ideas of Dr. Brocklesby, I would propose the director, or eldest surgeon

*Observations, page 43. 2 B

in each army respectively, *with two or more hospital* surgeons to be a medical board, of which a field officer should always sit as president. It should meet statedly once a month and occasionally by order, as may be found necessary. They should be authorised to digest rules and carry into execution every thing, relative to the medical department. But no act of theirs should be valid or take effect, until issued in orders, with the consent and approbation of the commander.

The advantages of such a board are too numerous and obvious to require particular mention. Congress are too distant and commonly too much engaged to attend to special exigencies of the hospital. This board would be always at hand, and would have nothing to divert it from its proper duty. It would specially prevent any misunderstanding between officers of the line and the hospitals, and bring them into that perfect concert and harmony most advantageous to the sick.

By common consent, every regiment is furnished with a surgeon and one mate at least. Sir John Pringle, who, from ample experience was induced to lay great stress on the regimental practice, recommends that in time of war, each regiment should be furnished with a surgeon and two mates; least by the surgeon or mate falling sick, the regiment should suffer.

But we have no established rule to guide us with respect to the proportion of *hospital* surgeons necessary for an army. In our army the number provided has differed from 4 to 40 or 50. We know that excessive numbers answer no valuable purpose; that in this as well as every

other extravagance, the sick are injured rather than benefited. After mature deliberation, I am of opinion, that one hospital surgeon to every division of the army, would be a good proportion. I am told there are thirteen divisions or commands of Major Generals, in the whole American army ; and I am convinced, from sufficient observation, that the same number of surgeons would be adequate to all prescriptive duty necessary in the hospitals of the several armies employed by Congress. It is true they ought to be well chosen and well paid ; they would then be subject to strict discipline, and would do all the duty with alacrity, cheerfulness and success.

It may be remarked, that I make no distinction between physicians and surgeons, regardless of the British example. I know that in Britain, a high degree of civilization and luxury have divided the practice of physic and surgery ; and that after the fashion of their country, the British are, in some measure, obliged to put these professions into different hands, in their military hospitals. It is however, very different, in our country, where every medical character, practises both professions ; and it is found, by experience, in our army, to be impracticable to separate these duties. Dr. Jones, of New York, in his useful treatise published at the commencement of the war, has said enough to dissuade us from this error. And was it only to guard against complexity, and to render our system simple and manageable, and consequently better fitted to the inexperience of a young army, I would abolish the distinction.

For all the purposes of good order and subordination among the surgeons, it is only necessary to number them, according to priority of appointment. Nothing is more certain, from authority and experience, than that every surgeon should direct the practice of his own hospital; he being the best judge of every thing necessary for his own patients. Hence it was, that the *physicians general*, in the late arrangement, held perfect sinecures. And from a regard to truth, I hope to be pardoned for the assertion, that the invidious distinction made, by the new arrangement between hospital physicians and *chief* hospital physicians, must be worse than useless, as well as unprecedented.

Every hospital surgeon will require two mates to his assistance, who, together with the regimental mates should be appointed with a proper regard to their opportunities and medical abilities.

And having shewn, as I apprehend, that the direction of practice and purveyorship of hospitals should be separated into different hands; that large and extensive hospital plans, with complexity of system, are dangerous to the army, in proportion to their extravagance; that simplicity of system and frugality in the economy of hospitals are most happily connected with success; and that the regimental practice should bear a great proportion to that of the general hospital; that a regimental surgeon and one mate to every regiment, and a hospital surgeon and two mates for every division or major general's command in the army, are a good proportion of medical officers; that it is of the utmost consequence to the army to attain able

surgeons by a mode of appointment that is honorable ; and to retain them into long experience, by sufficient pay : and that every surgeon ought to be interested, as much as possible, in curing the sick ; that a parade of titles and a high degree of subordination are unnecessary & inconvenient to the medical staff ; & that numbering the surgeons, according to priority of appointment, is sufficient for good order in the hospitals ; I shall next proceed, with the strictest regard to these established principles, to describe

A PLAN OF ARRANGEMENT.

There shall be one physician in chief to the army and director of the military hospitals, thirteen surgeons, and twenty six mates for the general hospital ; a surgeon and one mate to every regiment ; an apothecary and two assistants ; and a purveyor and one assistant.

The physician in chief and any two or more hospital surgeons shall make a medical board, of which a field officer shall sit as president. It shall meet once a month, or oftner if requisite, by general order. They shall appoint the regimental and hospital mates ; and shall examine and recommend the regimental and hospital surgeons ; and none but those recommended by the board shall be appointed to vacancies. It shall be their special duty, from time to time, to settle the proportion of regimental and hospital practice ; and to make regulations accordingly. They shall prescribe the measures for supplying the sick effectually with medicines, stores, provisions, &c. It shall also

be their duty to make out proper estimates for the purveyor, inspect his accounts and transactions, and regulate his plan of issues, so as to prevent waste and extravagance. As often as required, the director shall report to the board a full state of all the hospitals under his direction and receive their instructions. This board shall enquire into all complaints brought against officers of the department, and present to a court martial such as they may think deserving of censure. And this board shall be authorised to digest rules and carry into execution every thing relative to the medical department: provided, nevertheless, that no regulation of theirs be valid and take effect, unless issued in orders, with the consent and approbation of the commander.*

The physician in chief and director shall have a general superintendency and direction of practice, both in camp and hospitals. He shall always maintain an office near head quarters, so as to be ready, at all times, to consult and advise with the commander in chief; and to distribute the necessary advice and direction to the surgeons; with whom it shall be his duty to correspond. With the concurrence of the commander in chief, he may establish such hospitals as the service requires; and shall make the necessary dispositions for conducting them. In time of engagement or any emergency, he shall call into the field as many hospital surgeons as the occasion may require; and by order of the

* Such a board as this was established in the British army, 1756, at the request and during the command of his royal highness, the duke of Cumberland; whom Blacklesby celebrates for his systematical ideas and most excellent regulations of discipline.

general, may have assistance in the hospitals, from the regimental surgeons. It shall also be the special duty of the director, frequently to inspect all the hospitals under his direction; to see that they are managed with economy and success; to correct all abuses; to suspend and bring to trial all delinquent officers; and to make monthly returns of the sick to the commander.

In the absence of the director from camp, the surgeon eldest in appointment shall do his duty. Every surgeon shall direct his own hospital, agreeably to the regulations, from time to time, adopted by Congress, or the medical board and communicated to him by the director. He shall be authorised to order from the purveyor or his assistant, or from the commissaries or quarter masters of the army, or to be purchased from the neighborhood, whatever is necessary and convenient for the sick; and shall be accountable for his conduct and success in the practice to the director; but shall not be dismissed the service, without due form of trial.

When two or more surgeons are on duty in the same hospital, each shall act independently, with respect to all matters relating to his own particular charge, and shall be accountable to the director only, or the surgeon presiding in his stead. In case of dispute, with regard to any matter respecting the hospital, the surgeon of senior appointment shall control, until the matter in dispute can be decided by the director, or in his absence, the presiding surgeon.

The regimental surgeons shall give diligent attention to such regulations as may be established respecting their conduct; and shall manage the sick of their respective regiments accord-

ingly : and shall also be accountable to the physician in chief, as the common head of the medical department.

The hospital and regimental mates shall observe the direction of the surgeons ; and shall diligently perform all the reasonable duties required of them, for the recovery of the sick. They shall also make out returns of the sick, for the surgeons respectively, agreeably to such forms as the director may require.

The apothecary and his assistants shall receive, prepare and deliver medicines and dressings, and other articles of his department, to the hospitals and army, on orders in writing, from the director or surgeons. He shall appoint a proper number of males to assist him in his duty ; and shall furnish one to every hospital, where one is required by the director.

All the instruments delivered, by whose order soever obtained, shall be paid for, at prime cost, by the surgeons or mates receiving them.*

The purveyor shall provide all necessary medicines, utensils and stores of every kind, that may be ordered by the medical board ; for the delivery of which, a written order from the director or a hospital surgeon, shall be his voucher. It shall also be his duty to pay all the officers of the hospital and every debt and expence of the sick, after being duly certified. For these purposes, he shall draw money from the treasury, agreeably to the estimates given him by the medical board. He shall settle his accounts of expenditures, *in money*, every three months ; and

* This will be attended with two good consequences. Great waste will be prevented, and the surgeons will be furnished with better instruments.

once a month, he shall lay a state of the expenditure of stores, with the stock on hand, before the medical board.

The purveyor shall direct the conduct of his assistant; and by advice and order of the medical board, shall appoint such other assistants, store keepers and clerks as the service may require.

In every hospital, the purveyor or his assistant shall appoint a steward, whose duty it shall be to purchase vegetables, straw and other small articles, to receive the stores and provisions, for the use of the hospital, and deliver them, agreeably to the orders of the prescribing surgeons. And although, in his purchases & issues, he is to obey the orders of the prescribing surgeon; yet, for the faithful discharge of his office, he is to be accountable to the purveyor; and for this purpose, he shall keep separate accounts of all he receives from the purveyor, quarter masters and commissaries, and of what he purchases himself from the country; and shall render an account of all his issues monthly, with his stock on hand, to the purveyor: thus to enable the purveyor to lay the whole monthly expence of the hospital before the medical board. The steward's vouchers shall express, not only by whom ordered, but by whom received also.*

In every hospital, the steward shall appoint a matron and a proper number of nurses, to be under the direction of the prescribing surgeons, and paid by the purveyor.

During the summer, when the army is in the

* May we not thus expect a satisfactory account of the stores, which have never been obtained by any plans of issues hitherto practised.

field, besides regimental infirmaries, the director may institute a flying or field hospital, in the rear of the camp, and appoint proper surgeons to conduct it: considering it always as a branch of the general hospital, and to have one common regulation with the same.

One surgeon at least, whom the general may choose,* shall always reside near head quarters, to attend the general and staff officers, and to be in readiness for any emergency.

When a division or detachment of the army is sent off, or in any manner becomes a distinct and separate body from the main army, the medical board shall nominate its proportion of the medical staff, over which the surgeon eldest in appointment, shall preside, with all the powers of physician in chief and director; and shall form a medical board, to be authorised as before mentioned. And when two armies unite, having each a separate board, one shall dissolve of course.

When officers of the line do duty in hospitals, the medical board shall make rules for their conduct, that they may not interfere with the surgeons; and they shall receive their instructions by general order.

* It will doubtless be a spur to every surgeon to excel, that he may be the choice of the general.

ECONOMICAL OBSERVATIONS
ON
MILITARY HOSPITALS, &c.
PART II.

ADDRESSED TO COMMANDING OFFICERS.

It may seem strange at first view, that I should call upon commanding officers to take care of the health of the men under their command, or that I should expect they would pay any regard to the sickness incident to an army. I hope, however, in the sequel to shew that upon them especially depend the health and comfort of the soldiers; and that the medical staff are only to be regarded as adjutants, in the recovery of the sick.

But before I proceed further, it may be proper to premise, that whatever may be the form of government in the state, whether monarchical or republican, the government of the army must be despotic. Although there may be rules and regulations for its better government, so much discretion must be left with the commanders, as amounts to an authority that is arbitrary. The principle of honor, therefore, in an army is, to obey implicitly the commands of superior officers.

To abate the disgusting effects of this rigorous though necessary mode of governing an army, wise commanders, in all ages, have assumed to themselves a patriarchal relation to all those under their command. Thus what could not be accomplished by force, was more effectually obtained by a parental influence. General Washington affords a notable example. He was

indeed styled the father of his country, as well as the father of his army; and the probity and faithfulness of his character justly entitled him to the appellation. Marshall, in his history, remarks: "happily for America there was in the character of Washington, some thing which enabled him, notwithstanding the discordant materials of which his army was composed, to attach both his officers and soldiers so strongly to his person, that no distress could weaken their affection, nor impair the respect and veneration in which he was held by them. To this sentiment is greatly to be attributed the preservation of a respectable military force, under circumstances but too well calculated for its dissolution."*

But generals are not the only characters, who should cultivate this fatherly disposition towards their men. Colonels of regiments and captains of companies are under equal obligations, both of duty and interest.—And even subaltern officers should be excited, from like motives, to exert their influence, within the sphere of their authority.

Every officer, with parental benevolence implanted in his breast, towards his men, will comprehend the following remarks, and regard them as pertinent and proper.

In a young and inexperienced army especially, the officers are too apt to consider military duty as the only obligation upon them, regardless of the condition of their men, whom, if they fall sick, are without further thought turned over to the care of the surgeons. The ignorance and irregularities of the men, in a new scene of life, subject them to numberless

diseases. The sick flow in a regular current to the hospitals; these are crowded so as to produce infection; and mortality ensues too affecting to describe.

Our revolutionary army exemplified this misfortune in a manner shocking to humanity.—The flying camp of 1776 melted like snow, in the field; cropped like rotten sheep on their straggling rout home, where they communicated the camp infection to their friends and neighbours of which many died.

The history of our military hospitals is an interesting subject, but not within the compass of my present design. I can only mention a few instances, which may serve as examples of the rest. After the battles of Brandywine, Red-bank, &c. a general hospital was established in the college of Princeton, where I was a prescribing surgeon. The sick and wounded, flowing promiscuously without restraint into the hospital, it soon became infectious and was attended with great mortality. I caught the jail fever myself and narrowly escaped with my life. After a tedious illness, I got leave to return home for the recovery of my health. The enemy occupying Philadelphia, at that time, it became necessary for me to take a circuitous rout to the state of Delaware, through Bethlehem, in Pennsylvania. At Bethlehem was another hospital, and I found it convenient to rest there a day or two. During my stay, it was natural to enquire into the state of their hospital. The method I took was to propose a competition, not whose hospital had done the most good, but whose hospital had done the most mischief. I was requested to give an account of Princeton

hospital; I stated with all the exaggeration I could with truth, not only an affecting mortality among the sick and wounded soldiers, but that the orderly men, nurses and other attendants on the hospital were liable to the infection; that I had myself narrowly escaped death; and that five other surgeons and mates had afterwards been seized. I was answered that the malignancy and mortality of Princeton hospital bore no comparison with theirs; that at Bethlehem not an orderly man or nurse escaped, and but few of the surgeons; that one surgeon, Jos. Harrison, a fine young fellow, distinguished for his assiduity, had died. And to give me some idea of the mortality of their hospital, one of the surgeons asked me if I were acquainted with that fine volunteer regiment of Virginia, commanded, I think, by col. Gibson. I answered I knew it only by reputation. He then went on to say that forty of that regiment had come to their hospital, and then asked me how many I supposed would ever join the regiment? I guessed a third or a fourth part. He declared solemnly that not three would ever return, that one man had joined his regiment; that another was convalescent and might possibly recover; but that the only remaining one besides, was in the last stage of the colliquative flux and must soon die. I was obliged to acknowledge the hospital at Bethlehem had been more fatal than that at Princeton.

The hospitals of the American army, although a striking example of their mortal effects, are not so singular as might at first view be imagined. Dr. Pringle tells us, that "after the battle of Dettingen the village of Feckenheim was employed for an hospital, into which, be-

sides the wounded, about 1500 sick were sent from the line ; and of that number the greatest part was ill of the dysentary. By these men the air became so much vitiated, that not only the rest of the patients, but the apothecaries, nurses and others employed in the hospital with most of the inhabitants of the place were infected. To this was added a still more alarming distemper, namely the Jail or Hospital fever, the common effects of foul air from crowds and animal corruption. These two combined occasioned a great mortality in the village ; while such of the men as were seized with the dysentary and not removed from the camp, though wanting many conveniencies that others had in the hospitals, kept free from the fever and commonly recovered."* The Doctor proceeds to add, that the camp breaking up, on moving, " 3000 sick were left in Germany, there the hospital fever and dysentery grew daily worse. Few escaped ; for however mild or bad the flux was, for which the person was sent to the hospital, this fever almost surely supervened. The petechial spots, blotches, parotids, frequent mortifications, contagion and the great mortality sufficiently shewed its pestilential nature. Of fourteen males employed about the sick, five died, and excepting one or two, all the rest had been ill and in danger. The hospital lost near half of the patients. But the inhabitants of the village having first received the flux and afterwards this fever by contagion, by the two were almost entirely destroyed."† And in suc-

* Diseases of the Army, p. 22.

† Diseases of the Army, p. 25.

ceeding pages the same ingenious author further adds that when soldiers were taken ill where there was no common hospitals, the hospital or jail fever was unknown; that in the campaigns of 1745 & 46 "most of the deaths were from the Jail fever; and advises carrying at all times as many of the sick along with the *regiment* as can easily be transported.*"

Not only hospitals filled with sick, but whole encampments of well men may become infectious. War and pestilence are proverbially connected together. Homer in describing a plague that infested the Grecian camp, according to the mythology of his day, attributes this misfortune of the greeks, to the anger of the gods, whom, with poetic licence, he engages on both sides, in this ten years siege. With the light of modern times, there can be no hesitation in concluding, that from the long continued occupancy of the same ground, their camp had become infectious. The plague of Athens is recorded by Thucydides as a monument of human misery, perhaps unparalled in the history of the most cruel wars.

Pringle sets this matter in a strong point of view by describing two encampments, or rather two divisions of the same encampment, at a small distance from each other and under like circumstances, in every respect, except that one was infected and the other was not.*

(Many melancholy instances might be adduced of infection in the American encampment. I will mention one. In the year 1776, when the army

* Diseases of the Army. p. 105.

* Diseases of the Army, p. 21.

was encamped at King's Bridge, in the State of New York, our raw and undisciplined condition at that time, subjected the soldiers to great irregularity. Besides a great loss and want of clothing, the camp become excessively filthy. All manner of excrementitious matter was scattered indiscriminately through the camp insomuch, that you were offended by a disagreeable smell, almost every where within the lines. A putrid diarrhœa was the consequence. The camp disease, as it was called, became proverbial. Many died, melting as it were and running off by the bowels. Medicine answered little or no purpose. A billet in the country was only to be relied upon. When the enemy moved up the East river, our army moved to White Plains, and left their infectious camp and the attendant diseases behind them. It was remarkable, during this disorderly campaign, before our officers and men could be reduced to strict discipline and order, the army was always more healthy when in motion, than in fixed camps.

From all the conversation I have had with some of the most sensible officers of General Wilkinson's army, there is no doubt upon my mind, but that the great mortality at *terre aux boeuf* in the then territory of New Orleans and now State of Louisiana, proceeded from an infectious encampment. It is impossible to account for the obstinacy and fatality of those bowel complaints which affected the soldiers, either from the nature of the clime or the soil, but from a poisonous infection.

Brocklesby observes, "that the register kept of the mortality produced by fevers of various kinds

in military life, shews, that full eight times the number of men have been lost, in this manner, of late, more than fell immediately by their wounds, or in battle."* I have no register or record from whence to prove the proportion of deaths in the American army; but have no hesitation in declaring it as my opinion that we lost not less than from ten to twenty of camp diseases, for one by the weapons of the enemy.

I might proceed to add a long list of quotations from different authorities, to the same point, evincing the malignancy and dangers of military hospitals and infectious camps; but as brevity is essential to my design, I shall, without further delay, advert to those ways and means, by which military officers have it much in their power to prevent and alleviate the ordinary sickness and distress of an army.

For these purposes, discipline is of the first consequence. Without it, there can be neither health nor comfort in an army. Waste and want follow of course, with all their attendant evils.—But more is comprehended under the word discipline than the mere exercise of arms. It may therefore be proper to specify some prominent articles.

All authorities agree, that in subserviency to health, the military exercises ought to be performed in the morning, before the heat of the day, especially in warm weather. But in fixed camps, the ordinary exercise of arms is not sufficient to keep the men in good plight. Some have advised plays; but the indiscretion of

* Observations, p. 300.

soldiers is not to be trusted. They would probably err both as to time and degree in amusements of this sort. The best advice I have attended to is that of short marches and other military exercises at the discretion of their officers. Under the next article will also be suggested a variety of exercises.

Cleanliness is essential in all conditions of life, but especially to soldiers. Without the necessary cautions on this score, an army is literally poisoned, and dwindles into insignificance. Officers, therefore, should be very solicitous to protect their men, as well as themselves, from the dreadful effects of filth and nastiness. The utmost care should be taken that the men appear not only neat and clean in their persons, but that their bedding is sweet and comfortable. For this purpose their straw and blankets should be brought out of the tent and aired twice or three times a week. They should be employed at leisure times, in making small trenches round their tents, more effectually to guard against excessive moisture in their floors. Bathing should be encouraged in warm weather, with this caution however, that the men should remain no longer in the water than is necessary to make their skins clean. That the camp may be kept free from excrementitious filth of every kind, a penalty should be annexed to dropping any thing of this kind within the bounds of the encampment. If adjacent to a river or running stream, every thing of this sort may be thro'n into it and swept away. Even the privies might be built over it to great advantages. Otherwise deep pits should be sunk and all excrementitious matters and

filth of every kind thrown into them and covered with a layer of dirt every day. When privies are sunk in the earth, they should always be to the northward and eastward of the camp: for the winds blowing from these quarters being cool, neither raise the effluvia in the same quantity nor exalt them in the same degree, as do the warmer southern and western breezes. Brocklesby, to enforce the importance of cleanliness, quotes the divine lawgiver, Moses, for his injunction on the Israelites, when he says, "thou shalt have a place without the camp, whither thou shalt go forth abroad; and thou shalt have a paddle on thy weapon, and it shall be when thou shalt ease thy self abroad, thou shalt dig therewith and shall turn back and cover that which cometh from thee. For the Lord thy God walketh in the midst of the camp; therefore shall thy camp be holy, that he see no unclean thing in thee, & turn away from thee."* Here it may be observed, that this wise lawgiver enforces this duty, by the obligations of religion and morality: for he reminds his people of the omnipresence of the deity; and as we are commanded to do no murder, so are we required as we would expect the blessing of heaven to use all lawful means to preserve our own lives and the lives of others.

Besides excrements, a variety of other matters require to be cleansed from the camp. Dead horses, carrion of every kind and every thing of a putrid nature should without delay, be buried in the earth, which by a law of nature, has the power of correcting and sweetening, every thing putrid. Keep the Camp clean and you run no risk of infection, otherwise it be-

* Deut. Chap. xxiii. ver. 12, 13, 14.

comes more dangerous to the health and lives of officers and men, than the weapons of the enemy.

Clothing is very properly arranged under the head of discipline. Besides the ordinary dress, even the cut of a man's hair is the subject of official orders. The common winter dress of our soldiers being a full suit of cloth, is totally unfit for the summer season. Every man thus encumbered must be weakened, dispirited and often sickened by it. Our soldiers, therefore, should be furnished with summer as well as winter suits. From the first of June until the first or middle of September, they would be most alert in white cotton round about Jackets, so as not to be impeded, in action, by skirts of such thin stuff. Pantaloons of the same, would be far more comfortable and healthful than of woollen cloth. A measure of this sort might possibly increase a soldier's baggage, as he would necessarily require two suits; but this difficulty, I apprehend, is not insurmountable; and the benefit is so manifest that I should expect every officer would be ambitious of the accommodation to his corps. The common suit of wollen coat, waist-coat and pantalets is enough for the ordinary duties of a soldier in winter. Watch coats may be convenient, occasionally, on sentinel duty. As to the smaller articles of shoes, stockings, cravets &c. they require no comment, except, that, in the warm season, I would advise them to be as little cum'rous as possible. Every soldier ought to wear gaiters to keep the dirt from his feet. Any where to the southward of the Carolinas, I have a strong impression, that cot-

ton will make more salutary garments for soldiers than wool, all the year round. I have been told, upon authority which I believed, that the French soldiery in St. Domingo suffered immensely from their European cloathing; that it was no uncommon thing when a party marched out of garrison, to disperse the negroes, for carts to be sent to bring in such as had failed and fainted from the heat of the sun aided by the oppression of their clothing.

The regular muster of clothing is of immense consequence to an army. Before the introduction of this measure, our army was kept bare and naked, by multitudes of soldiers selling their clothes for drink and otherwise wasting them. When the Baron Stuben was appointed inspector General, besides the muster of clothing, he introduced a number of salutary regulations, which contributed more to the health and comfort of the troops, than the utmost efforts of all the medical staff.

Diet is another article of immense consequence to a soldier. The ordinary ration is sufficient if well managed. The soldiers ought to eat in messes; and it would be of importance if an old well educated soldier could be associated in every mess. An old soldier would make good and wholesome food of materials that a young recruit would spoil, in such a manner, as hardly to be fit to eat. The British soldiers are paid weekly and there are stoppages of pay appropriated to the messes. This enables them to furnish vegetables and every thing necessary to good and wholesome living. Every regiment ought to have a regulation of this sort: for without good living their health cannot be maintain-

ed nor force and energy expected from them in the day of trial. Cares should be taken that the bread of an army be properly fermented and well baked. I recollect, in the campaign of '76, while our army was on the peninsula of New York, we were so deranged as to be deprived of ovens; and flour was served to the troops instead of bread. We could only make sodden bread and dumplings. Some baked their bread on hot stones and others in the ashes. The consequence was that many were afflicted with the Jaundice. Being a regimental surgeon at that time, I shared the fate of the rest, and shall never forget my fatiguing march from the north river to Brunswick, with the jaundice upon me.

To guard against accidents of this sort, a sufficient quantity of biscuit should always be in store. The Germans make great use of them, and I believe the French also. They would be particularly convenient for parties, when under the necessity of providing themselves with several days provision at once. Judge Peters, in the memoirs of the Philadelphia society for promoting agriculture* has given a learned essay on the importance of this kind of bread. He shews, by a chemical analysis, that biscuit is improved by leaving all the finer parts of the bran in the flour of which they are made; and he proves, on the authority of Baron Stuber, that the peculiar health of the Prussian soldiery was in a great measure to be attributed to *their ammunition bread*.

Hardihood is another article the American ✓

* vol. 1.

soldiery are not sufficiently attentive to. A delicate soldier is very ridiculous indeed. Hardihood sufficient to resist smaller accidents, is essential to the safety of a warrior, as well as his efficiency in duty. What officer or soldier can read the speech of the sage Nestor with indifference. Homer makes him tell the story of an old man admirably. He begins by a declaration that he had seen three or four generations pass before him, and then describes the heroic companions of his youth who harkened to his counsel and calls upon the men of succeeding and more degenerate ages to listen to his advice. What comparison would our soldiers make with Roman or Grecian troops? What comparison would they make with Russians or even Britons? These are enquiries worthy of attention. In other services, instead of adorning themselves like *pettit maitres*, it is not uncommon for officers and men to wear whiskers, and by every appearance of rudeness and hardihood, to present as terrible a front to the enemy as possible. Even savages have a just apprehension of the importance of measures of this sort. They not only paint their skins to fortify and protect them from harm; but they disfigure themselves in such a manner, as is most likely to dismay their adversary. With the reputation of a bold hardy race of men, our armies would certainly be more important in the view of their enemies, than if regarded as composed of delicate and weakly creatures.

In cultivating this essential qualification in a soldier, the skin is especially to be regarded, as the avenue through which most diseases assail us. According to Sanctorious, whose experi-

ments and authority have been deemed correct and valid by all his successors, five eighths of all we eat and drink must pass the skin. His experiments were made in the moderate climate of Italy. In our summers, probably, the proportion would be greater. This single circumstance shews the skin to be the most important emunctory in the body. And although the discharge is insensible, defects and irregularities in this excretion, shew themselves, in colds, coughs, fevers, fluxes and all manner of diseases. For if the skin fails to do its office, an excrementitious matter is retained in the habit and perhaps thrown upon the lungs or some other viscous, which thus becomes loaded with matter not only superfluous in quantity, but corrosive in quality, producing inflammation, ulceration &c. whence plurisy, consumption and a thousand modifications of diseases too tedious to mention.

From the preceeding view of the nature and function of the skin it must appear, that by keeping the skin in good order, you are exempt from colds, coughs and their whole train of consequences. Every Jockey can tell you the importance of currying his horse frequently. Any body that will try it, will find friction of equal consequence to the human body. This is most conveniently performed with a flesh brush; but is equally efficacious with the corner of a blanket.—It is best done every morning before rising out of bed. The shirt being stripped up to the arm pits, the whole surface of the body may be rubbed, except the arms and neck; and as often as a clean shirt is put on, the arms and neck may be well rubbed also. The soft parts

of the belly should be specially dwelt upon and rubbed with the most pressure. The whole process may be performed in one or 2 minutes.

I have myself been in the habit of this salutary practice for many years past; and can boast of an exemption from colds, coughs &c. except when the influenza prevails. That most subtle of all contagions seizes upon me, in common with other folks. But except from contagion, I have no apprehension of cold or cough. Any officer who will try the effects of friction, on his own person, will soon be led to regard it as an indulgence rather than a troublesome task; and will not hesitate to enjoin it upon his corps.

Although friction on the skin contributes more to salutary hardihood than any thing else I am acquainted with, yet there are many other things which deserve the attention of officers, as contributing to the health, vigor and activity of soldiers. If it were practicable, it would be dangerous for soldiers to sleep on soft beds. Straw is the best material for bedding. Officers should not trust themselves on any thing softer than hair mattresses. Flock beds should be rejected, as adapted to retain infection. Superfluous clothing is equally injurious with warm and relaxing beds. They both conspire to soften the skin and to render it delicate and susceptible of various impressions from the common air. Their injurious effects upon the skin should make officers and men very guarded against superfluous clothing, especially in warm seasons: for the skin is liable to excessive discharges, as well as to diminished and suppressed perspiration. A man may be exhausted sooner, by the pores of the skin, than from any excretion.

of the body besides. After the battle of Monmouth, I heard of more complaints arising from the heat of the weather, than from the weapons of the enemy.

Cold bathing, in warm climates and the summer season, is also of excellent use. It serves not only for cleansing the skin, but to strengthen and fortify the numerous nerves that terminate on the surface of the body, so as to render the skin less sensible and not so easily impressed by external causes. For this and other accommodations, wise commanders always chuse the banks of a river for their encampment, when they can make it convenient.

Not only the body, but the mind of a soldier should also be trained, in subserviency to health. The influence of the mind upon the body is astonishing. A sense of honor and reputation should, therefore, be cultivated, in every soldier, by all possible means. The French armies furnish a notable example of this measure. During the winter succeeding the campaign of 1781, I was quartered in the French garrison, to superintend the American hospital at Williamsburg. I remember that the maxim with the French soldiers was, *first the king and then the soldier*; that a French soldier despised all menial services; that waiters & soldiers were very different characters and were badged by different uniforms; that a French officer buying any thing in market, would not ask a soldier to carry it home for him; that drunkenness was regarded as equally disgraceful as stealing, so that I never saw a French soldier drunk. The young Viscount Rochambeau on a certain occasion, struck an old soldier with the flat of his sword. The

veteran retired, and unable to bear the reproach shot himself. The French officers did not hesitate to reprobate the rashness of the young viscount. The effect of this discipline appears in the present French armies. According to their bulletins, their soldiers maintained their usual gaiety and cheerfulness, amidst the disastrous events of their retreat from Moscow. I have heard Gen. Smallwood reprove his officers very severely for striking the men under their command; a practice too common in the American army. Little or no comment is necessary to shew the importance of this article of discipline. A soldier with self esteem and ambitious prospects before him, will not only be neat and clean, but prompt in all his duties. Whilst a fellow without any respect for himself, is slovenly, careless and often desponding to such a degree, as to be regardless whether he serves in camp or dies in the hospital.

Besides the above prominent articles a variety of ordinary and less important matters will naturally suggest themselves to well disposed officers, such as temperance, order, decorum &c. And for carrying their rules and regulations into effect, they can be at no loss, or if they wish for advice in relation to the health and hardihood of their men, they can at all times consult the medical board described in the first part of this work.

Brocklesby observes, ' that if any regiment or corps has the fortune to have only one judicious humane and sufficiently able field officer, it may always be wisely regulated and discreetly managed. But where the three field officers together happen to be perfectly well appointed,

active, judicious & desirous of every useful information, from literary men, as well as from those of their own profession, one may safely pronounce, that such a regiment will be fit for service at any time, on very short notice ; and on the hardest service, the soldiers “ *will not shed away from their officers, as sickly feathers, tho’ never so often supplied,*” as Milton finely expresses it ; but it will be free (all other circumstances being alike) from at least one half of those miseries and disasters which are usually incidental to military life’. He mentions the seventy-second regiment of foot as such a corps ; ‘ where all the regulations of its interior orders and the hidden springs of all its movements and actions, were so well contrived, and the mechanism was so exquisitely adjusted, that the whole as well as every part of a system, containing 900 human forms, appeared at all times, in their tents, *their hospitals*, under arms, and on a march, to be actuated and put in motion, merely at the volition, and by the command of the noble colonel, lieutenant colonel and major each in his department co-operating with one mind, to effect that entire, beautiful and harmonious arrangement.’*

Lieut. Col. Henry Lea was distinguished in our Revolutionary army, for the health and vigor of his corps. *I never saw one of his men in the general hospital ; and it was proverbial in camp, that Lee’s men and horses were always ready for action.*

From what has been said, I trust it will be sufficiently apparent that the health, hardi-

* Observations, p. 7.

hood and efficiency of an army depend very much, if not entirely upon the wise and prudent conduct of the commanding officers. And it may reasonably be inferred that the public will make a just discrimination between those who govern their men with so much discretion as to have them always fit for duty, and such whose men are constantly falling from them, *like the sickly feathers of a bird*. Honor and preferment will be the grateful rewards of the former; while the least the latter can expect is to be consigned to oblivion.

ECONOMICAL OBSERVATIONS ON MILITARY HOSPITALS, &c.

PART III.

ADDRESSED TO THE MEDICAL STAFF.

To enter into a laboured account of all the diseases incident to an army would swell this work to an useless volume. All I propose, therefore, is to advert in a concise manner, to those main points which distinguish hospital practice and the diseases of an army, from those of common life.

The cardinal point or principle to be observed, in the direction of all hospitals, is to avoid infection. When this can be done, the practice of hospitals differs little or nothing from private practice. But where infection, or foul air is suffered to prevail, no skill or address in practice can much avail. The cause must be removed, before the patients can be relieved by medicine. And while a poisonous atmosphere is constantly operating on the patient, the most powerful remedies, which act only pro tempore, must be constantly baffled. To avoid infection, it will be necessary to advert

1st. To the construction of hospitals.

2d. To personal cleanliness and treatment of the patients.

As to the construction of hospitals, I would observe that wood, above all other materials of which they are made, retain infection most per-

manently. Wooden houses, therefore, and especially wooden floors should be avoided. Earthen floors are best; and tents are better than sheds or wooden houses. The influence of the ground in neutralizing and correcting all manner of putrifaction is well known. Even putrid meat is sweetened, by burying it in the earth. The surface of a tent floor may be scraped off, or a new covering of fresh earth spread over it, as often as occasion may require; or what is still more expedient, a tent may be removed to a fresh surface, as often as you please. The walls of a tent may be sluiced in water and thus freed from all infection, as often as you shall think it necessary. A wooden building cannot be so cleansed. The best expedient hitherto discovered for cleansing wooden buildings, is founded on the mitchillian doctrine, by white-washing. This may serve for the walls; but wooden floors once infected are irreclaimable. The more you wash them with water the worse they are; you must abandon them.

Tents, I should suppose would be particularly proper in warm climates as well as in our warm summer seasons. They may be opened at pleasure so as to admit the most free current of air. It is much easier to pitch the number of tents requisite, than to prepare houses. The number of tents may also be proportioned to the number of sick, so as to run no risk of crowding them. I have used common horseman's tents, and long tents formed like the roof of an house prepared expressly for hospital purposes.

But in cold climates and winter seasons,

some better protection than tents afford may be necessary. In such cases, the best hospital I have ever contrived was upon the plan of an Indian hut. The fire was built in the midst of the ward, without any chimney, and the smoke circulating round about, passed off thro' an opening about four inches wide in the ridge of the roof. The common surface of the earth served for the floor. The patients laid with their heads to the wall round about, and their feet were all turned to the fire. The wards were thus completely ventilated. The smoke contributed to combat infection, without giving the least offence to the patients: for it always rose above their heads, before it spread abroad in the ward. And more patients could be crowded with impunity in such wards, than in any others I have seen tried. This was the expedient I employed in the hard winter of 79, 80, when the army was hutted near Morris Town, and I was well satisfied with the experiment.

But the plan of this hospital hut will be better understood, by turning to the elevation and ground plan, on the succeeding pages. The first of these shews the elevation. In this it may be observed, that the smoke passes off through funnels elevated above the roof; that one window is open and the others shut; that all the air and light are let in from the south front.

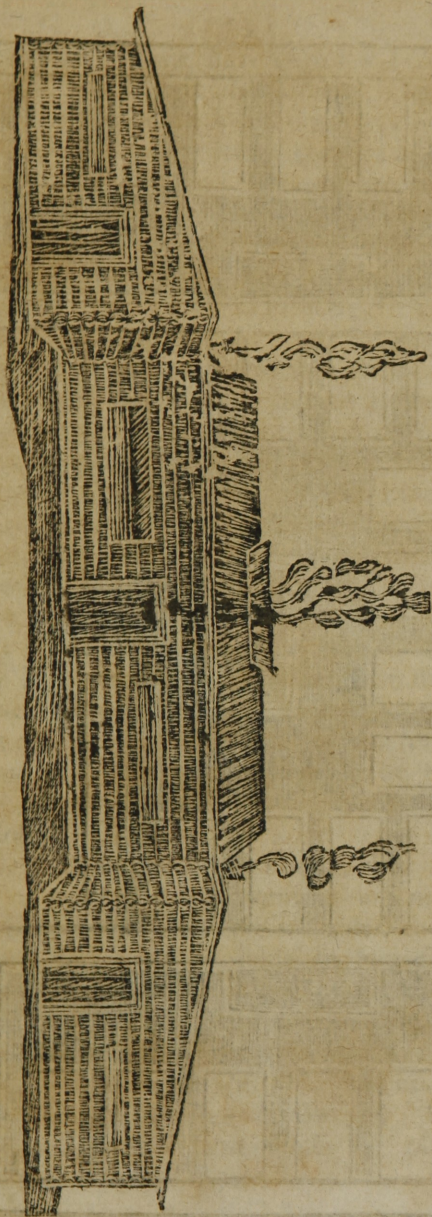
In the ground plan A. represents the doors, B. the fire places, c. c. &c. the bunks or bedsteads, in which the patients were placed.

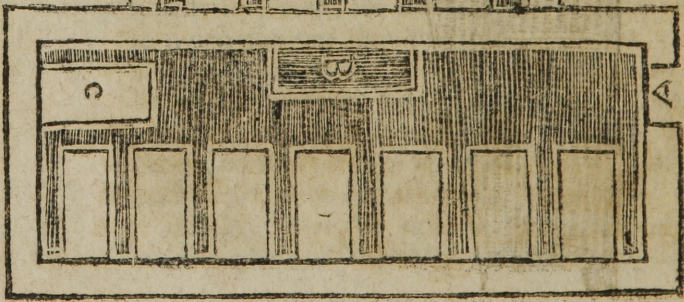
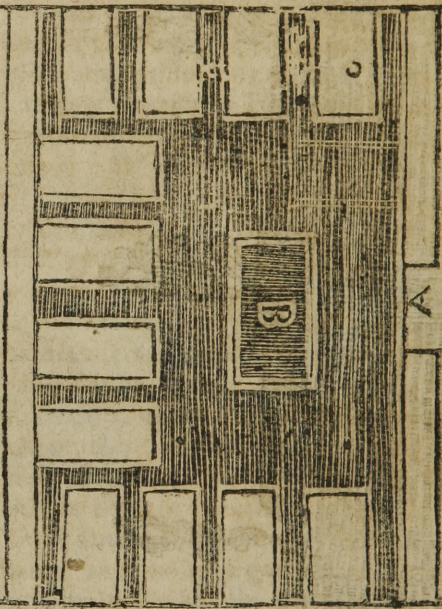
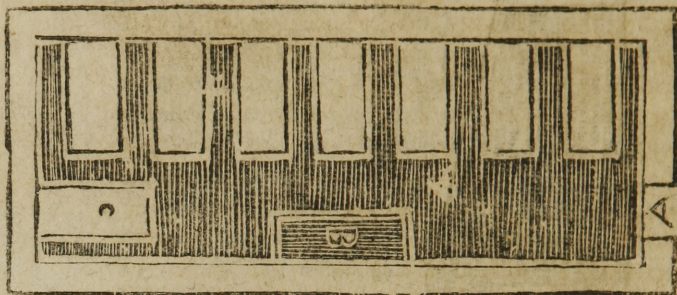
It should be noted also that the walls of this hut were built of rough logs, without hewing; that the chinks were daubed with mortar made of common clay and water only; that the mid-

dle or main ward 31 1/2 feet by 19 1/2 in the clear was assigned to febrile patients; and the smaller end wards 35 1/2 by 16 feet clear were occupied by the wounded and other cases of topical affection.

I am aware that Sir J. Pringle inveighs against ground floors. It may therefore be necessary to obviate the weight of his authority by shewing that his experience and mine are not so inconsistent as might appear at first sight. Pringle's observations were made in the marshy and swampy district of Holland; mine were made in the high and dry lands of the American continent. Pringle too denies the occult qualities of the air which, according to Sydenham, proceed from the bowels of the earth and have great influence in the prevailing constitution of the atmosphere. Sir John attributes all the vices of our atmosphere to its sensible qualities, such as heat, cold, moisture, dryness &c. I am the more surprised at the opinions of this great authority, as he is the grand advocate and champion of contagion or infection, as you may please to call it. Why not vicious exhalations from a bad and corrupted soil, as well as from putrid substances above ground? If moisture were to be regarded as the most noxious quality in the air, the sea ought to be considered as more noxious than the land; and yet every sailor can tell you it is not so. Surely there can be no comparison between the air of an open surface, even on low and swampy grounds, & the damp and foul air pent up in old waste buildings such as are generally taken for hospitals.

All agree that the ordinary enemies of our country proceed from vicious qualities in the air





we breathe. Some have expressed an opinion that this vice of our atmosphere producing intermitting and remitting fevers &c. is a mere negative quality, proceeding from a defect of oxygen or vital air. Others are of opinion that this noxious quality is positive and proceeds from chemical combinations in the atmosphere that are poisonous to the human body. In a conversation I had with Dr. Priestly, he gave it as his opinion, that this vice of our atmosphere was positive and not negative. He said he had made experiments, with the eudeometer upon air taken from all situations, from the depth of infectious prisons, low marshy districts and airy mountains; and that he had found the proportion of oxygen and azote nearly the same. He added, that the precise nature of this noxious poison was not yet ascertained; that it probably never would be discovered by a direct enquiry; but that some lucky fellow might hit upon it, by accident, as he did upon the method of ascertaining the proportion of oxygen to that of azote, in our common atmosphere.

But let Sydenham or Pringle be correct, I have a right to plead my experience as well as sir John. I know that I found tents the most convenient and successful hospitals. They not only allowed of better ventilation but enabled me to assort the sick and wounded more effectually than could be done in houses. Infectious cases, such as jail fever, dysentery and putrid diarrhœa could be placed at any distance I chose from other patients. By raising the walls opposite to the sun, the patients received the full benefit of a free ventilation. In case of great malignancy a patient may be placed in a

small tent by himself, so as not to endanger his fellows. The only objection I have met with and which I think more plausible than solid, is, that, in very warm weather they do not sufficiently exclude the heat of the sun. This may at all times be obviated by covering the tents with green boughs or arbours: though I must confess, I was never reduced to this kind of expedient. The British writers appear to be very much bound down by the authority of Sir John Pringle. Nevertheless, Brocklesby is obliged to confess he had astonishing success, by employing some fly-tents in the rear of the camp.*

As to personal cleanliness, the best devices are to be provided with the means of washing and cleansing every patient that enters the hospital. A clean shirt and bedding should be provided for every patient; and his foul clothes thrown, without delay, into water. It may be hazardous to omit this in one single instance, since one infectious patient, like one scabby sheep, may spread the contagion through any number collected together. Their bedding and other clothes should be frequently changed. Washing the face and hands in water or vinegar and water, every morning, will always be found refreshing and salutary.

The bedding of a sick soldier in the American hospitals, in houses as well as in tents, consisted of a bunk or cradle, a palias or bedtick of coarse linen filled with straw and one or more blankets. The same bedding should never be used for more than one patient without cleansing. The best method of cleansing

* Observations, p. 248.

the bunks is to turn them out of doors to receive the full benefit of air, rain, frost &c. All manner of clothing should be washed.

The utmost care should be taken to remove all excrementitious matter from the wards, so as to leave no smell behind them. If there be no running stream at hand, every thing of this sort should be sunk deep in the earth and covered every day. The necessaries should be to the northward and eastward of the hospital, for reasons mentioned in the second part of this work.

The importance of separating those ill of fevers, fluxes &c. from the wounded and such as have only slight topical affections, will readily be perceived. Many a fine fellow have I seen brought into the hospital, for slight syphilitic affections and carried out dead of a hospital fever.

The convalescents, as soon as put upon the analeptic course, should be removed as far as convenient from the sick. Milk is the grand restorative for convalescents, and vegetables generally are useful, in combating that putrid tendency to which all hospital patients are so liable.

It was suggested in the first part of this work, that the hospital practice of an army should be compressed within the narrowest compass possible. While in camp or quarters, all acute diseases should be treated in regimental infirmaries. Wounds and chronic complaints alone should be permitted to enter the general hospital. The medical board should procure a general order to this effect. By a measure of this sort the hospital will be secured from crowding, except on the breaking up of the camp and march of the army, or after a battle. On such occasions,

the best possible means of making room and to avoid crowding is to employ tents. They may be pitched to any extent required. On such occasions it is customary to summon all super-numerary surgeons, from the regiments as well as the hospital, to give their assistance.

With these precautions duly regarded and diligently practised an army has the best chance of escaping diseases of a malignant nature. Nevertheless incidental hardship, accident or misfortune may produce those complaints more peculiar to camp life. These are chiefly the jail fever, dysentery and putrid diarrhœa. I will advert a little to each of these. But with my usual brevity, I shall only attend to prominent features, without descending to minutiae.

The jail fever generally gives some days notice of its approach, by a languor and listlessness of the whole body, and a peculiar sensation of the head as if it were tightened, or compressed in a hoop. The febrile attack is very much in style of the Synochus, as described by Cullen. It is not uncommon for the symptoms to run pretty high in the beginning, so as to warrant blood letting and an antiphlogistic course. But after some days, more or less, in different patients, the pulse begins to sink; a dry tongue, delirium and the whole train of nervous and putrid symptoms supervene. If I ever saw the petechiæ, so much dwelt upon by Pringle and Monro, I have forgotten all about them. This I am sure of, they were not regarded as essential to the disease.

Although often compelled to let blood in the commencement of this fever, we were cautious

of repeating this operation ; and were disposed to avoid it altogether, when not demanded by a full pulse and other pressing circumstance . After bleeding, if that operation should be thought necessary, a vomit was deemed of excellent use, by opening and squeezing all the glands of the body, and thus shaking from the nervous system, the contaminating poison, before its impressions are fixed. With this view the earlier the vomit is administered the better. During the prelude or those marks of approaching danger above described, a vomit may prevent the fever altogether.

When the fever is formed, mercury is of the greatest importance, so long as any signs of an inflammatory diathesis remain. This Sampsonian remedy has the power of subduing all manner of contagion or infection that we are yet acquainted with. Thus, besides syphilis, itch &c. without fever, it is regarded as specific in small pox, measles, scarlatina, influenza, yellow fever &c. and is found to be not less successful in the early stages of Jail fever. The manner in which this remedy sets all the secretions afloat, may serve in some measure to explain its beneficial effects. Hence it is that in yellow fever, remitting or any other fever, if we can only touch the patients mouth with mercury, we regard him as safe.

In the American hospitals, we were accustomed to give Calomel, in various forms, according to circumstances : sometimes alone, or mixed with opium, tartar emetic, neutral salts &c. The following prescription will be found of extensive use and should always be kept as an official.

Take of Calomel two drams ; Opium one dram ; Tartar Emetic fifteen grains ; Syrup enough to make sixty pills. Here it may be observed that each pill contains two grains of calomel, one grain of opium and one fourth of a grain of tartar emetic. Of these one pill may be taken every night, or night and morning, according to the exigency of the case.

This form of medicine may be used, not only in all contagious and infectious diseases, but in all fevers whatsoever, where the inflammatory diathesis prevails ; and may be regarded as the most powerful of all antiphlogistic remedies. I have given it in inflammations of the lungs, liver &c. to the greatest advantage. I do not recollect to have seen it tried in inflammations of the stomach and bowels ; but in ordinary colics it may be regarded as specific.

The neutral draught will always be found a good adjutant remedy, administered more especially in the exacerbation or rise of the fever. It is idle, however, to talk of lemon juice in a camp. Even good vinegar is not easily obtained. Cream of Tartar is portable and answers as well or better than either. One dram of salt of tartar and two or three drams of cream of tartar rubbed together and dissolved in a quart of boiling water, forms one of the best neutral mixtures. Of this the patient may take two ounces, every two, four or six hours, according to circumstances.

But the antiphlogistic course, and especially calomel, must not be continued longer than the inflammatory diathesis prevails. As soon as the pulse sinks, and a dry tongue, delirium and

other typhous symptoms predominate, we must have recourse to bark, wine, volatile salts, blisters &c.

It would be impossible to take notice of all the combinations and contingencies that may be connected with jail fever. It may be observed, however, that in the typhous grade of this fever, we gave the *sal cornu cervi* liberally and to advantage; especially in such cases where we had doubts of the bark; and in severe cases they were both employed.

A dry tongue generally warranted the use of the bark; and this medicine was used liberally by tasking the patient, from half an ounce to an ounce in the 24th hours, according to the magnitude of the disease.

Wine was deemed a capital remedy, in every stage of typhus. In my own case before mentioned*, besides an obstinate delirium, I had a crust on my tongue as thick as the blade of a knife, and black as soot. The skin was worn off my hips and dorsal vertebræ, so as to make it necessary to patch those parts with common plaister. At the acme of my disorder, eleven surgeons and mates belonging to the hospital, all gave me over, and only disputed how many hours I should live. Providence ordered otherwise. My friend Doctor Rush paid kind attention to me; and a benevolent lady of the neighborhood sent me several gallons of excellent wine. I drank freely of this liquor, and took, at the same time, liberally of Huxham's tincture. My tongue soon after began to moisten on the edges; and in the course of some

* Page 29.

days, the whole crust fell off and left it so raw and irritable, that I was obliged to hold skinned almonds in my mouth to abate the irritation of so tender a part. When so far advanced in convalescence, as to be able to stand, I could hardly walk for the soreness of my feet. All the cuticle scaled off from my skin: and all my hair gradually combed off from my head: so that instead of my former straight hair, I had an entire new suit that curled beautifully. Being reduced to skin and bones, I had a voracious appetite for filling up the waste; and in a moderate space of time recovered a more than ordinary plump habit; but it was not less than nine months, before I gained the usual elasticity of my muscles: insomuch, that I could not cross a gutter otherwise than by stepping over it: for I could exert no spring. I am the more particular in the narration of this my own case not merely to exemplify the efficacy of wine; but to shew, that a patient thus severely affected, cannot be fit for duty, afterwards, during the campaign.

Blisters were used in local affections, and in the low and depressed state of jail fever, with manifest advantage.

Opium was also rated among the first of stimulants; and was particularly useful, in case of a lax state of the bowels.

The Dysentary, besides bleeding, frequently required a vomit in the first instance, especially when the stomach was sick. Afterwards, our ordinary practice was to keep the bowels freely open with small drops of calomel given at bedtime and repeated doses of Sal. Cath. Amarum, during the day, until the griping abated, and

then the cure was completed with gentle astringents, anodynes &c. No disease requires a more perfectly low diet than the dysentery. The nearer the regimen approaches to simple water, in this disease, so much the better.

Frequently, however, the dysentery was complicated with the jail fever; and then it became hazardous and required a treatment conformable to that disease.

The putrid diarrhæa was generally the result or dregs of other camp and hospital diseases; and was the most intractable disorder of any we had to deal with. The patient would often be able to move about, with little or no fever, his skin remarkably dry and husky, and constant drain from his bowels. Various attempts were made to force the skin, by warm bathing, Ipecacuanha mixed with opium &c. and by that means, to divert the current of humours from the bowels; but all to no purpose. The only restringent I recollect to have been of any use, was recommended to us by Doctor Craik, one of our physicians general, noted for his great range in the materia medica. It consisted of Tinct. Huxham. and Tinct Japon. equal parts. Of this mixture one or two spoonfuls were given every morning before breakfast, and again before dinner. But while the patients remained about the hospital, nothing appeared to have more than a palliative effect. Multitudes melted away, as it were, of this miserable complaint and died. The only expedient I ever found effectual for their relief was to billet them in the country, where they could enjoy pure air and a milk diet; or to furlough them to their own homes, if within their reach. I have repeatedly

since the war, met with old soldiers, who have acknowledged their gratitude to me, in the warmest terms, for saving their lives, as they expressed it, by using my influence with their officers, in procuring their furloughs.

As to gun shot wounds, the only observation that occurs to me worth mentioning is, that the longer we continued in service, amputation and cutting generally became less fashionable. From obstinacy in the patients and other contingencies, we had frequent opportunities of observing, that limbs might be saved, which the best authorities directed to be cut off. I have seen gun-shot wounds through the elbow, knee and ankle successfully cured without the loss of the limb. It therefore became a maxim with us to take the chance of saving the limb, in such cases. And we found no disadvantage in waiting, until some necessity compelled us to operate. I find Mr. Benjamin Bell, a late surgical writer of Edinburg, recommends the same practice.

Sir John Pringle, who lays great stress on the sensible qualities of the air, expresses his greatest fears, for the Summer season. All my observations convince me that the diseases incident to an army are much the most fatal in winter. Then the foul air is pent up in the hospitals, and becomes exalted to such a poisonous malignancy as to make all approach to them hazardous. Stricter care, therefore, and greater diligence is to be observed, in warding off the dangers of winter, than those of summer, when we can employ the common breeze to fan away infectious miasmata. Gun-shot wounds, too, are more injured by cold than by heat.

The Potters field of Philadelphia bears melancholy testimony of the fatal effects of cold weather on the military hospitals in the fall of 76 and succeeding winter. Instead of single graves, the dead were burried in large square pits, in which the coffins were placed in ranges, cross and pile, until near full and then covered over. Whether this measure was adopted to save labour or to save ground, in either case, it witnessed great mortality.

After the siege and capture of Yorktown in Virginia, Gen. Washington returned to the northward and the French troops were cantoned in Williamsburg. I was left in charge of the sick and wounded Americans, who could not be moved. Being thus in a French garrison, I had some opportunity of observing the French practice and management of their sick. In passing the wards of their hospital, their patients appear very neat and clean, above all examples I had ever seen. Each patient was accommodated with every thing necessary, even to a night cap. Nevertheless, they were not more successful than we were. Even their wounded, with all the boasted dexterity of the French to aid them, were no more fortunate than ours. I was led to attribute their failure principally to two causes. For ease and convenience, they had contrived a common necessary for their whole hospital, the college, a large building, three stories high, by erecting a half hexagon, of common boards, reaching from the roof down to a pit in the earth. From this perpendicular conduit doors opened upon each floor of the hospital; and all manner of filth and excrementitious matters were dropped and thrown down this common sewer, into the pit below. This sink of nastiness perfumed the whole house very sensibly and, without doubt, vitiated all the air within the wards. In the next place, their practice appeared to me to be very inert. When passing their wards, with the prescribing physicians I observed a great number of their patients in a languid and putrid condition, and asked, occasionally, if the bark would not be proper in such cases? The uniform answer was no, too much inflammation. And when they attended my round of prescription and saw me frequently prescribe the bark, in

febrile cases, and even for the wounded, they lifted up their hands in astonishment. Few or no chemical remedies were employed by them. One of their regimental surgeons declared, that he never used opium. Their hospital pharmacopœia consisted chiefly of ptis-ans, decoctions and watery drinks, fitted only for inflammatory disorders. All these circumstances considered, satisfied my mind, why their ample accommodations gave them no advantage of us, in the result of practice. I was the more surprised, as Doctors Cost and Borgelli both appeared to be men of science, well qualified to make research.

My brethren of the faculty will probably think it an interesting fact, that more surgeons died, in the American service in proportion to their number, than officers of the line ! a strong evidence this that infection is more dangerous, in military life, than the weapons of war ; and should be a powerful excitement, with all concerned, from motives of self preservation, as well as honorable duty, to use all possible care & diligence, in warding off that greatest of all evils, *the plague of Infection*.

I cannot conclude this part of my work, without expressing a hope and expectation, that measures will be taken for handing down to posterity, a complete history of our military hospitals, during the present war. We now abound in men of talents amply qualified for the task. The medical board, if such should be appointed, might take measures for collecting the documents ; and at the end of each campaign, one or more qualified persons might be appointed to collate and digest the whole into due form. It is acknowledged by all who have written on the subject, that this branch of military science has been shamefully neglected. We have reason to conclude, from dreadful experience, that European plans do not suit us. Our countrymen have distinguished themselves in the cultivation of the arts and sciences generally ; and here is the widest field for cultivation, that has at any time presented itself. I have ventured to offer some new ideas, from my own experience. I wish the opinions I have advanced to be proven and a system established, adapted to our own country, and for the common benefit of mankind.

FINIS.

Erratum.—In the first page of the Preface, 10th line from the bottom, for *modes* read *mode*.

Page 24, 16th line from the top, for *males* read *mates*.

Page 41, 15th line from the top for *vicious* read *viscus*.



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